

Title (en)
Crosstalk-reduced integrated digital optical switch

Title (de)
Integrierter digitaler optischer Schalter mit verringertem Übersprechen

Title (fr)
Commutateur optique numérique intégré à diaphonie réduite

Publication
EP 0857996 A1 19980812 (EN)

Application
EP 98300751 A 19980203

Priority
US 79963797 A 19970210

Abstract (en)
Methods and apparatus for performing optical signal switching or other optical routing functions in an optical device or system, in which crosstalk induced by modal interference is suppressed by providing appropriate loss, gain and/or refractive index changes in different parts of a switch structure. An exemplary optical signal switch (10) includes first and second branches (14-1;14-2) each having a refraction-controlled section (30-1;30-2) and an absorption-controlled section (32-1;32-2). An optical signal path over which an optical signal propagates in passing through the switch is selected to include a portion of at least one of the first and second branches, such that one of the first and second branches is a selected branch and the other branch is a non-selected branch. The refraction-controlled section of the selected branch is configured in a high effective refractive index state which allows the optical signal to propagate along at least a portion of the selected branch, while the refraction-controlled section of the non-selected branch is configured in a low effective refractive index state. The absorption-controlled section of the selected branch is configured in a low absorption state, while the absorption-controlled section of the non-selected branch is configured in a high absorption state to reduce crosstalk within the optical switch. An effective refractive index in a given refraction-controlled section may be provided using electro-refractive techniques such as the quantum-confined Stark effect (QCSE) or the Franz-Keldysh effect, or by carrier-induced effects such as carrier injection or carrier depletion. An absorption change in a given absorption-controlled section may be provided using electro-absorptive techniques or a gain-switching technique. The switch may be configured as a Y-branch switch, a directional coupler, or in other suitable configurations, and may be interconnected with other similar switches to construct 1xN, Nx1, NxM and NxN switch arrays. <IMAGE>

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CPC (source: EP US)
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Citation (search report)
• [X] EP 0380983 A2 19900808 - HITACHI LTD [JP]
• [X] EP 0568704 A1 19931110 - FURUKAWA ELECTRIC CO LTD [JP]
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• [X] PATENT ABSTRACTS OF JAPAN vol. 014, no. 027 (P - 992) 19 January 1990 (1990-01-19)

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